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# ISWIM NEWSLETTER

## Message from the ISWIM president

Dear Readers,

Welcome to the first edition of our newsletter for 2019.

It is pleasing to see another full and complete newsletter with all WIM stakeholder groups represented.

I urge you to consider attending the International Conference for Weigh-In-Motion (ICWIM8) in Prague in May 2019. The Conference program is set and available on-line. ICWIM8 will be held as a series of scientific and technical sessions, a number of panel discussions and "end-users' forums" were the end-users will receive information about the best practices and the application of WIM data, and WIM vendors and consultants will present their solutions. This is not an annual event, this event occurs once every three years and deliberately so to capture significant milestones in the journey of Weigh-in-Motion.

I urge you to register for ICWIM8 and look forward to seeing you all there. Happy reading and as always available for a chat or a discussion through our Linkedin Connection or email below.

President – ISWIM
Chris Koniditsiotis

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## Young Researcher Award

Four young scientists have received for the ISWIM Young Researcher Award. They have been selected based on their contribution to the Weigh-in-Motion (WIM) field and passion through their studies or early professional life. ISWIM will fully sponsor them to attend the 8th International Conference on WIM (ICWIM-8) in Prague later this year to present their work, visit the exhibition, and further develop their industry knowledge and global network.

## In this issue

The recipients of the ISWIM Young Research Award are:

Mariana Bosso completed her bachelor in Civil Engineering at University of São Paulo, Brazil in 2014. In 2018, she received her Master's Degree in Transportation Infrastructure at Polytechnic School of the University of São Paulo. In the recent years, she has been working in one of the biggest toll road groups in Brazil, EcoRodovias, as Project Manager Engineer. Her current research involves WIM technology and traffic characterization proving the importance of overweight enforcement, and the consequences on accelerated pavement distresses.

Muhammad Arslan Khan is a postgraduate researcher at University College Dublin working in the project, 'MARS-FLY for Bridge Network Resiliency', which aims to develop bridge monitoring techniques using Unmanned Aerial Vehicles. He is focused on the development of a Bridge WIM system that uses accelerations instead of strains and the use of the inferred WIM data to monitor bridge condition. Apart from his research career, he also has a year's industrial experience in a highway and transportation construction in his home country of Pakistan.

Michael Olfert is currently pursuing his Master's degree in civil engineering at the University of Manitoba. For his graduate research, he is investigating the feasibility of using a commercially available portable WIM system to collect reliable axle load data in the context of Canadian regulations, industry, and climate, with particular consideration given to methods of indirect application of the data.

Leonardo Guerson is a researcher at LabTrans and a transportation engineering masters' student at the Federal University of Santa Catarina, Brazil. Among his relevant work performed in the field of WIM, he led the implementation and operation of a test site for evaluation of High-Speed WIM and ITS solutions in Brazilian conditions as well as the development of a WIM Data Quality Management System for the Brazilian federal road network. Currently, his main area of research involves the study of data management, aiming at the application of WIM data in overload control strategies alternative to traditional weight enforcement.

## Solution to protect the El Carrizo Bridge in Mexico.

With a central tower that is 226 meters tall, El Carrizo is currently the second highest bridge in North America and a very important part of Mexican road network, connecting Mazatlán and Durango. Because of the serious traffic accident in January 2018, when a tanker containing diesel fuel overturned and caught fire, the bridge had to be closed for several months. In order to protect the structure of the bridge and to prevent such accidents in the future, the company that operates the highway had to find a way to pre-select heavy vehicles that exceed the allowed weight of the bridge. An automated, dynamic system was required and Kistler WIM technology was the first option.

## International Conference on Weigh-In-Motion, ICWIM-8

The 8th International Conference on Weigh-In-Motion (ICWIM-8) will be held in Prague, Czech Republic from 19-23 May 2019. After North and Latin America the conference comes back to Europe, and for the first time in Central Europe. ICWIM-8 is organised by ISWIM and the Czech Transport Research Centre (CDV).

ICWIM-8 will be held as a series of scientific and technical sessions, a few panel discussions and some "end-users' forums" where the end-users will get information about the best practices and the application of WIM data, and WIM vendors and consultants will present their solutions.

The conference is designed to address the broad range of technical topics related to heavy vehicles and weight and size measurement systems, providing access to current research and best practices, freight analysis, and related policy issues. It is a multi-disciplinary, inter-agency supported event. Its objectives are:

- Provide an international forum for WIM technologies, WIM standards, research, policy, operations and applications.
- Facilitate the meeting of manufacturers and users in an exhibition of WIM systems, sensors and related technologies.
- Review new developments since the last International conference ICWIM-7, held in Brazil in 2016.

More information on the conference can be found at:

www.is-wim.org/icwim8/

El Carrizo Bridge in Mexico.

Two checkpoints with Weigh In Motion (WIM) technology have been installed in summer 2018. The location of the sensors was determined to be before the toll stations that surround the bridge so they can pre-select the heavy vehicles and have enough space to detour those vehicles from the bridge itself. The trucks – both with and without trailers – are traveling on the bridge at average speeds of 90 km/h.

Kistler supplied the local contractors with the necessary technology: two Kistler Lineas sensors Type 9195GC41 at each measuring station and the WIM data logger Type (5204AC04). The new WIM system ensures that the axle load and total weight of every vehicle are determined accurately. In the period from August to September 2018 alone, the system identified 135 vehicles that exceeded the maximum weight of 59.4 tones.

Tomas Pospisek | Tomas.Pospisek@kistler.com

## ICWIM-8 End-User Sessions

The goal of the end-user sessions is to attract existing and potential new end users of WIM systems. This will be fullfilled through presentations of end-users' real life experiences with various applications of WIM systems/data, and dialog between vendors and end-users. The second goal of these sessions is to convene WIM vendors with potential new customers and their needs and requirements. Each session will cover one main application topic.

Each sponsor and exhibitor of ICWIM8, as well as the participants who subscribe to the "end-user workshop presentation", will have a 10-minute slot (15 minutes for major sponsors) in one of these sessions. The vendors will share experiences with their particular WIM-solutions or applications or present their show case projects and application, always with the focus on the end-user. The sessions are not meant for sole commercial presentations of the WIM products.

## ICWIM-8 continued

Who should attend:

- Researchers in WIM technologies, WIM data analysis, vehicle-road or railway interaction and freight logistics.
- Manufacturers, vendors and users of WIM systems, data, or related equipment and services.
- Policy makers and agencies responsible for heavy vehicle operation and control, weight and size enforcement, road and railway infrastructures design, construction and maintenance.
- Agencies that use weight information to support freight mobility, safety and road pricing.
- PhD and post-doc students in freight transport and road infrastructures.

| Registration type | Fee* |
|---|---|
| Delegate | €600,- |
| Student | €300,- |
| One Day | €300,- |
| Accompanying person | €170,- |

*Advanced registration until May 1st 2019

More information on the conference can be found at: www.is-wim.org

Or contact:

Bernard Jacob | bernard.jacob@ifsttar.fr

Night view of the old city of Prague, Czech Republic

ISWIM will appoint a chairperson among its members for each workshop the chair will briefly introduce the topic, introduce the speakers, take care of the time and lead the discussion. A session secretary will take notes and prepare a short synthesis of the session, to be published after the conference on the ISWIM web site. At least 15 minutes will be reserved for questions and answers.

Bernard Jacob | Bernard.jacob@ifsttar.fr

## PAT-Traffic celebrates 35 years WIM in Chile

International Road Dynamics (IRD) subsidiary PAT-Traffic Ltda. installed the first 13 weigh stations in Chile in 1982 and 1983. Since then, these weigh stations have operated 24 hours a day, only closing for maintenance. Today there are 35 PAT Traffic installed and serviced weigh stations using weigh in motion (WIM) across the country. The use of WIM has reduced overloading, increased pavement life, and reduced accidents that involve heavy trucks.

Commercial vehicle crosses the first of two WIM scales

## Coming events

8th International Conference on WIM
Prague, Czech Republic
May 19-23, 2019
www.is-wim.org

Southern African Transport Conference
Pretoria, South-Africa
Jul. 8-11 2019
www.satc.org.za

CVSA Annual Conference + Exhibition
Biloxi, Mississipi, USA
Sept. 22-26, 2019
www.cvsa.org

PIARC, 26th World Road Congress
Abu Dhabi, UAE
Oct. 6-10, 2019
www.piarc.org

26th ITS World Congress
Singapore, Singapore
Oct. 21-25, 2019
www. itworldcongress2019.com

3rd ANTT WIM Workshop
Brazilia, Brazil
Dec .5-6, 2019
To be confirmed

TRB Annual Meeting
Washington DC, USA
Jan. 12-16, 2020
www.trb.org

Intertraffic Amsterdam
Amsterdam, the Netherlands
Mar. 21-24, 2020
www.intertraffic.com

Transport Research Arena
Helsinki, Finland
Apr. 27-30, 2020
www.traconference.eu

NaTMEC 2020
Raleigh, North Carolina, USA
JUN. 1-4, 2020
www.natmec.org

If you know other WIM-related event please contact:

Hans van Loo | hans.vanloo.int@gmail.com

Each weigh station consists of two WIM scales that measure axle weight, axle group weight, and total vehicle gross weight. The first of these WIM scales is a high-speed system used for vehicle screening purposes. It provides 95% accuracy at two sigma. Lane control signals automatically direct potentially overweight trucks to the second scale. This second scale is a low speed high precision WIM with 97% accuracy at two sigma. The second scale confirms the commercial vehicle is overweight, and the system automatically generates a citation ticket based on the second scale weight. LPR cameras are used to identify vehicles that fail to report as directed by the lane control signals.

Rish Malhotra | Rish.Malhotra@irdinc.com

## ISWIM User Guide

Over the past decades vast amount of scientific and practical experience has been gathered on the development, installation and operation of WIM systems. However, this information often comes in the form of scientific papers or research reports containing many technical details that the WIM beginners have difficulties to understand. WIM beginners often have difficulties to find a document providing a basic, yet comprehensive introduction to WIM. The International Society for Weigh-In-Motion has developed a 'WIM User Guide' in order to fill this gap.

The Guide covers different aspects related to the working, specifying, buying, installing, testing, maintaining and using of WIM systems and data. To enhance accessibility for users starting with WIM, these topics are described in easy-to-understand language. For those interested in more details and scientific explanations references to other reports are included.

The document will try to answer questions like:

- What is weighing-in-motion, what does a WIM system measure and what factors influence WIM measurements?
- What is the importance of weight information and what are possible applications of WIM data??
- What technologies are available and what performance may be expected from a WIM system?
- How to select a suitable location to install a WIM system?
- How to test if a new WIM system meets its specifications?
- What is involved in the maintenance and operation of a WIM system?

This document will not answer questions like: What is the best WIM system or technology available? And how much does a WIM system cost? Such questions depend too much on the application the user has in mind and the specific local conditions to be able to answer in a general document like this.

The WIM User Guide will be officially launched during the ICWIM8 and will be made available on the ISWIM website free of charge.

Hans van Loo | Hans.vanloo.int@gmail.com

## ISWIM Vendors

Axtec
www.axtec.co.uk

Betamont
www.betamont.sk

Camea
www.cameatechnology.com

Captels
www.pesage-captels.com

Cestel
www.cestel.eu

Cross
www.cross.cz

ECM
www.ecm-france.com

Haenni
www.haenni-scales.com

Intercomp
www.intercomp.com

IRD / PAT Traffic
www.irdinc.com

Kapsch
www.kapsch.net

Kistler
www.kistler.com

Mikros
www.mikros.co.za

Sterela
www.sterela.fr

TDC / Q-free
www.tdcsystems.co.uk

TE Connectivity
www.te.com

Traffic Data Systems
www.traffic-data-systems.net

WanJi Technology
www.wanji.net.cn

Wheelright
www.wheelright.co.uk

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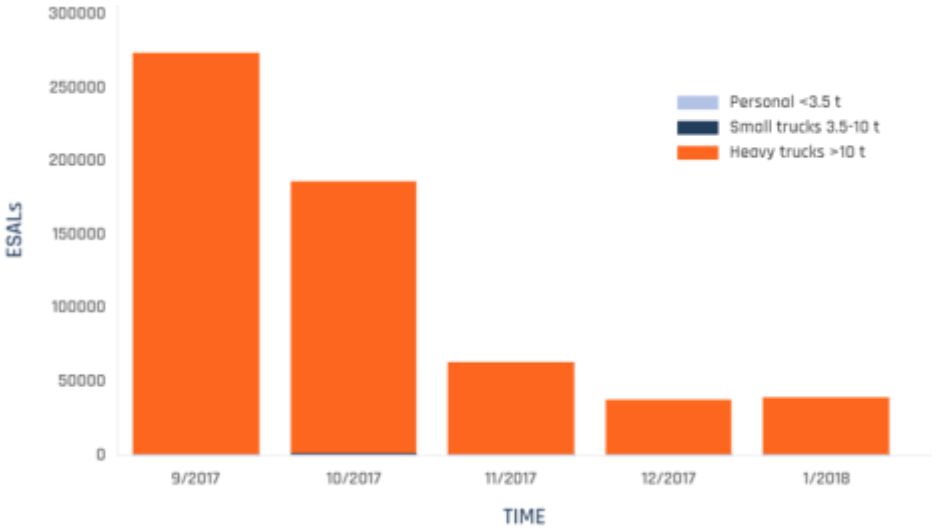
## Effects of Using Direct Enforcement WIM

Local authorities often face reality when comparing projected and true road lifetime. The projected lifetime is based on a qualified estimation of traffic intensity and structure. Yet it is very complicated to predict a number of overloaded trucks, just like it is very important, as these vehicles are the ones causing the most road damage.

A traffic study carried out on a station in Russia aims to determine the level of road damage as accurately as possible. It also shows that the real driveway condition differs from the one according to the original plan. Under these circumstances, it is necessary to repair the road as soon as possible, as the costs rise exponentially with time. Weighing vehicles on axles provides data accurate enough to determine the actual road load, which enables the user to plan maintenance effectively – to repair in time and avoid unnecessary expenses. Most importantly, when used for enforcing, it decreases the road damage, as shown below.




Road stress decrease after employing direct enforcement WIM

Installing the CAMEA WIM system for direct enforcement results in a significant drop of the number of overloading violators. That decreases the road damage up to five times and it disables illegally heavy trucks from driving through the place. They are either loaded in accordance with the rules, or they use a different path. To prevent the second option, building a dense web of WIM stations is a desirable action.

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